**IN THE SPECIFICATION:**

The specification as amended below with replacement paragraphs shows added text with underlining and deleted text with ~~strikethrough~~.

Please AMEND paragraphs [0002]-[0003], as follows:

[0002] The present invention relates to an inkjet printer, and, more particularly, to an ~~injection~~ejection controlling device for an inkjet printer, and a controlling method thereof, that is capable of adjusting an amount of ~~injected~~ejected ink properly.

1. Field of the Invention

[0003] A general inkjet printer drives an ink ~~injection~~ejection heater for ~~injecting~~ejecting ink in an ink cartridge to print onto a printing medium. The inkjet printer comprises a heater driving control unit for controlling a width or waveform of a driving pulse to drive the ink ~~injection~~ejection heater according to a temperature of an ink cartridge head.

Please AMEND paragraphs [0005], [0006], [0008], [0010], [0013], [0017], [0019], [0020], [0023]-[0026], and [0031], as follows:

[0005] Conventionally, the temperature of the ink cartridge head is measured so that the width of the driving pulse is changed according to the measured temperature, to adjust a possible time for ~~injection~~ejection. Namely, when the measured temperature is lower than a predetermined temperature, the pre-heat pulse P1 is added, or the width of the main pulse is lengthened, to increase an amount of energy applied to the heater. Further, when the measured temperature is higher than the predetermined temperature, the pre-heat pulse is removed, or the width of the main pulse is shortened, to decrease the amount of energy applied to the heater, thereby obtaining a uniform ink ~~injection~~ejection feature.

[0006] With the above conventional method for adjusting the pulse applied to the ink ~~injection~~ejection heater according to the temperature of the ink cartridge head, the same pulses are applied to all heads, according to the temperatures of the heads, without distinction as to whether the heads are of a mono cartridge or a color cartridge. However, there are variations according to the heads, and resistances of the ink ~~injection~~ejection heater in a predetermined range, which function as important factors in determining the amount of ink ~~injection~~ejection energy. These variations prevent a uniform amount of ink ~~injection~~ejection, thereby degrading the printing quality.

[0008] Accordingly, one aspect of the present invention is to solve the foregoing and/or other problems by providing a controlling device for an ink ~~injection~~ejection heater of an inkjet printer and a method thereof that is capable of removing a variation due to each ink cartridge head by setting an optimal width of a pulse, depending on each head, for supplying uniform ~~injection~~ejection energy.

[0010] The foregoing and/or other aspects and advantages are realized by providing a method of controlling an inkjet printer comprising determining whether an ink cartridge is installed in the inkjet printer; printing patterns in order by driving an ink ~~injection~~ejection heater with an array of predetermined pulses with widths that vary in sequential order in response to the ink cartridge being connected to the inkjet printer; detecting printing densities of the printed patterns; determining the pattern with an optimal density among the printing densities; and storing the width of the pulse corresponding to the pattern with the optimal density as an optimal pulse width.

[0013] According to another aspect of the invention, a controlling device for an inkjet printer having an ink ~~injection~~ejection heater comprises: a cartridge receiving part installing an ink cartridge therein and outputting an install detection signal; a driving part driving the ink ~~injection~~ejection heater, in accordance with an external input control signal, to ~~inject~~eject ink in the ink cartridge while performing a printing operation; a sensor detecting printing densities of patterns printed on printing media by the printing operation driven by the driving part; a controlling part controlling the driving part so that pulses with widths that vary in sequential order by a predetermined width difference are applied to the ink ~~injection~~ejection heater to print patterns corresponding to the widths of the pulses, and determining the width of the pulse corresponding to the pattern with an optimal density by comparing the printing densities outputted from the sensor; and a memory storing the width of the pulse corresponding to the pattern with the optimal density determined by the controlling part.

[0017] These and/or other aspects and advantages of the invention will become apparent and more readily appreciated from the following description of the preferred embodiments, taken in conjunction with the accompanying drawings of which:

FIG. 1 is a graph showing a driving pulse of a conventional ink ~~injection~~ejection heater;

FIG. 2 is a block diagram of a controlling device for an ink ~~injection~~ejection heater according to an embodiment of the invention;

FIG. 3 is a flow chart illustrating the operation of the ink ~~injection~~ejection heater of FIG. 2;

FIG. 4 is a flow chart illustrating a determining operation of FIG. 3 in more detail; and

FIG. 5 is a view showing a pulse inputted by the operation in FIG. 3, printed patterns, and detected printing densities.

[0019] FIG. 2 is a block diagram of a controlling device for an inkjet printer according to an embodiment of the invention. As shown in FIG. 2, the controlling device comprises a cartridge receiving part 200 receiving an ink cartridge, a driving part 300 driving an ink ~~injection~~ejection heater to perform a printing operation, a sensor 400 sensing printing densities of printed patterns, a controlling part 100 setting widths of pulses to be inputted to the ink ~~injection~~ejection heater, and controlling the controlling device for the inkjet printer overall, and a memory 500 for storing an optimal width of a pulse determined by the controlling part 100.

[0020] The cartridge receiving part 200 installs the ink cartridge therein, and outputs a cartridge install detection signal to the controlling part 100 when the ink cartridge is installed. The driving part 300 applies pulses to the ink ~~injection~~ ejection heater in response to a control signal from the controlling part 100 to perform the printing operation by ~~injecting~~ejecting ink onto a printing medium such as a paper.

[0023] The optimal width of the pulse determined by the controlling part 100 is stored in the memory 500, and is set as a reference width of the pulse to be inputted to the ink ~~injection~~ejection heater during printing operations until a new cartridge is installed.

[0024] Hereinafter, a control method of using the above controlling device for the inkjet printer will be described with reference to FIGS. 3 to 5. FIGS. 3 and 4 are flow charts illustrating the process of the control method for the inkjet printer, and FIG. 5 is a view showing pulses inputted to the ink ~~injection~~ejection heater, printed patterns corresponding to the pulses, and printing densities of the patterns detected by the sensor.

[0025] First, it is determined whether the ink cartridge is installed in the inkjet printer with the ink ~~injection~~ejection heater (S10). Upon inputting a cartridge install detection signal, it is determined that the ink cartridge is installed so that the control method starts to detect an optimal width of a pulse according to an embodiment of the invention, but the control method maintains a standby status when the cartridge install detection signal is not inputted.

[0026] When the cartridge is installed, the ink ~~injection~~ejection heater is driven to print patterns in order corresponding to an array of predetermined pulses with widths in sequential order (S20). The array of the pulses with the widths in sequential order has pulses with descending widths, descending by an experimentally set width difference from a reference pulse with an experimentally preset mean width in a predetermined range, and pulses with ascending widths,

ascending by the set width difference from the reference pulse with the preset mean width. The input pulses are shown by graphs 202 of FIG. 5. With 'M_PW' representing the mean width of the pulses, and 'a' representing the width difference, it can be seen that the pulses with descending widths M_PW – a, M_PW – 2a, and M_PW – 3a, multiples of the width difference 'a' being subtracted from the reference pulse with the mean width M_PW, and the pulses with ascending widths M_PW + a, M_PW + 2a, and M_PW + 3a are inputted. 201 in FIG. 5 shows patterns printed corresponding to the pulses 202, which show a tendency that the more the width of the pulse increases, the more the printing density increases.

[0031] According to an embodiment of the invention, an optimal width of a pulse inputted to the ink ~~injection~~ejection heater can be set according to each head so that ink can be ~~injected~~ejected uniformly, thereby improving the printing quality.